BLUEONE

BWO 155 SL

ORIGINAL OPERATING INSTRUCTIONS

VORTEX

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MADE IN GERMANY

EC-Declaration of conformity

Name of issuing entity:	**Deutsche Vortex GmbH & Co. KG**
Address:	Kästnerstraße 6 71642 Ludwigsburg Deutschland
Product name:	Domestic hot water pump
Type designation:	**BWO 155 SL**

The designated product complies with the provisions of Directives:*

2006/95/EG

„Directive 2006/95/EC of the European Parliament and the Council on the approximation of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits“

and

2004/108/EG

„Directive 2004/108/EC of the European Parliament and of the Council on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC“.

Ludwigsburg, 01.01.2012
(Place, date)

(Legally binding signature of the issuing entity)

* The conformity of the product with the provisions of the Directives is proven by complete adherence to the following standards:

DIN EN 60335-1:2010-11; EN 60335-1:2002+ A11+ A1+ A12+ A2+ A13+ A14 :2010
DIN EN 60335-1/A15: 2012-03; EN 60335-1/A15: 2011
DIN EN 60335-2-51:2012-08; EN 60335-2-51: 2003+ A1+A2:2012

DIN EN 62233:2008-11; EN 62233:2008
DIN EN 62233 Ber.1: 2009-04; EN 62233 Ber.1:2008
DIN EN 62233 Ber,1:2009-04; EN 62233 Ber.1:2008

DIN EN 55014-1:2012-05; EN 55014-1:2006+ A1:2009+ A2:2011
DIN EN 61000-3-2:2010-03; EN 61000-3-2: 2006+ A1:2009+ A2:2009
DIN EN 61000-3-3:2009-06; EN 61000-3-3:2008
DIN EN 55014-2:2009-06; EN 55014-2:1997+ A1:2001+ A2:2008

Contents

Declaration of conformity	2
Safety, product description	3
Technical specifications	5
Installation*	6
Electrical connection*	9
Venting*	11
Speed adjustment*	11
Mounting cable box	13
Self-learning module	16
Description of functions	17
Servicing*	18
Replacement*	20
Faults and remedies	22

Chapters marked with * contain illustrations of the pump BWO 155.

Safety

These instructions are part of the product, are valid for all series named and describe how to use the product safely and correctly during all operating phases.

Warning labels and symbols

Warning label	Risk level	Consequences of non-observance
Danger!	immediate acute risk	fatal or serious injury
Warning!	potential acute risk	fatal or serious injury
Careful!	potentially hazardous situation	light injury, damage to device

Symbol	Meaning
	Safety warning sign: Take note of all information indicated by the safety warning sign and follow the instructions to avoid injury or death.
■	Information
▶	Instruction

General safety instructions

- Installation of the pump may only be performed by qualified personnel.
- Keep the operating instructions and other applicable documents complete, in a legible condition and permanently accessible.
- Read the operating instructions and make sure you understand them before working on the pump.
- This pump is suitable for drinking water only.
- Only operate the pump if it is in perfect technical condition; only use it as intended, staying aware of safety and risks, and adhering to the instructions in this manual.
- Before carrying out any installation or maintenance work, disconnect motor from power supply and ensure it cannot be reconnected unintentionally.

Product description

The pump BWO 155 SL **BlueOne** is a domestic hot water pump with a highly-efficient electronically commutated DC motor as drive source. It is built according to the original VORTEX spherical motor principle and contains a permanent magnetic rotor. The speed of the pump BWO 155 SL is infinitely variable.

The self-learning module

(also see chapter "Functional description" p. 17)

- automatically identifies the consumer's hot water consumption patterns within a short time. It identifies when hot water is needed and provides it proactively. Using the button controller, the comfort setting can be adjusted to the specific needs. LED indicators display the current operating status of the pump.
- automatically detects deviations from the "standard" pattern, e.g. weekends, absence and daylight-savings time.
- automatically detects the time for the thermal disinfection[1].
- switches the pump off as soon as the pump control detects that hot water is available in the domestic hot water (DHW) circuit.

In branched pipework without hydraulic balancing, the level of convenience may be reduced.

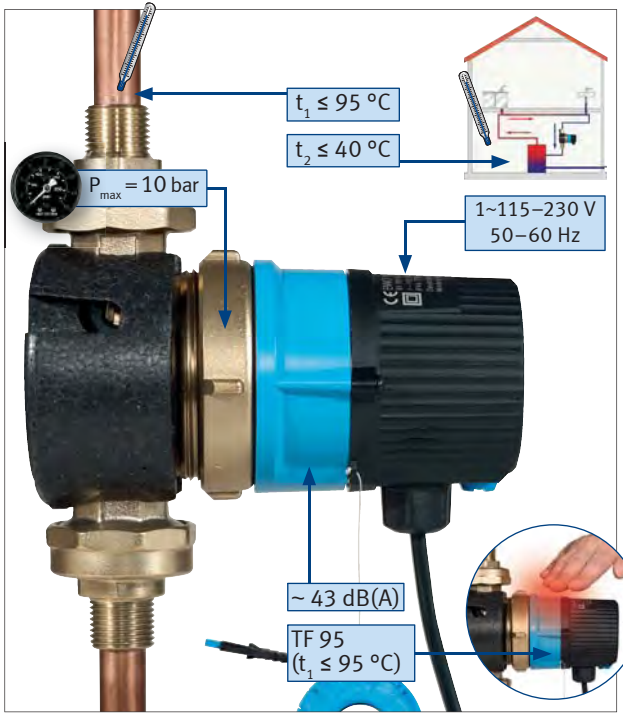
The pump run times can be reduced to a minimum with the BWO 155 SL. This does not contradict DVGW working paper W 551, since the protection required against the growth of legionellae is attained through regular thermal disinfection. This is performed automatically by the BWO 155 SL[1]. Furthermore, if the consumer is absent, regular water exchange in the pipework is ensured (daily flushing).

Scope of delivery

- Gaskets and selected union set for pumps with V-type pump housing
- Insulating cover for pump housing
- Operating instructions
- Cable box with temperature sensor, sensor cable[2] and detachable cable tie
- 3 cable ties for attaching the sensor cable

[1] Precondition: The hot water boiler has an anti-legionellae function.
[2] A 5m long sensor cable is available as an accessory.

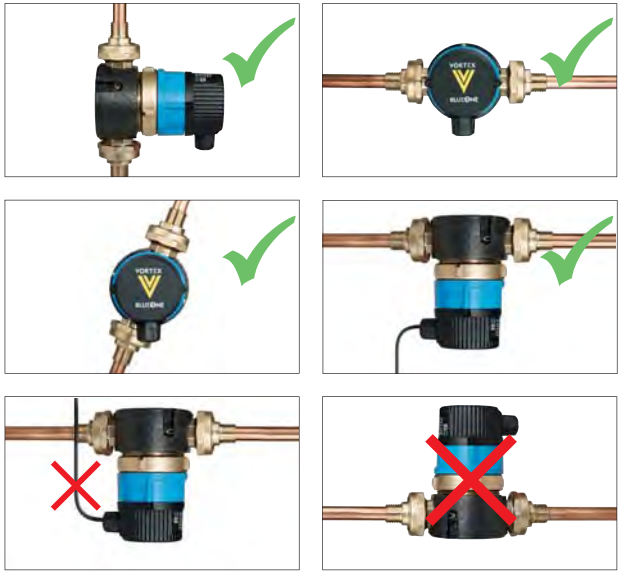
Technical specifications



Installation

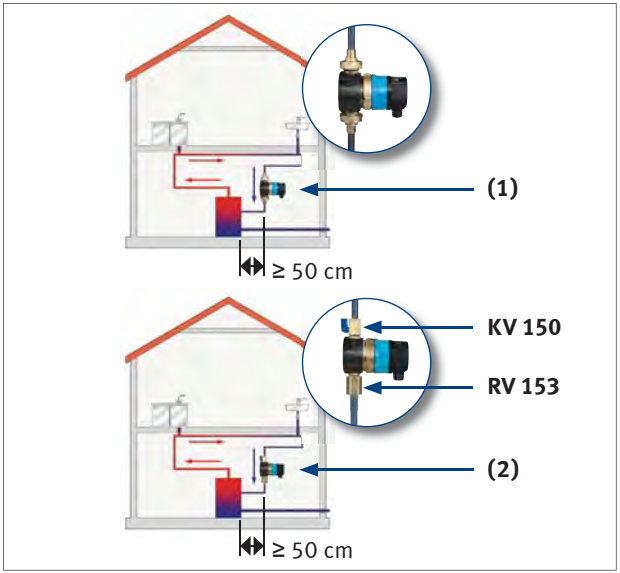
Careful! Damage to device caused by water intrusion.

► After mounting, ensure that the cable entry or the cable is pointing downwards (see fig.).



A shut-off valve and a non-return valve are already built into V-pumps (**1**).

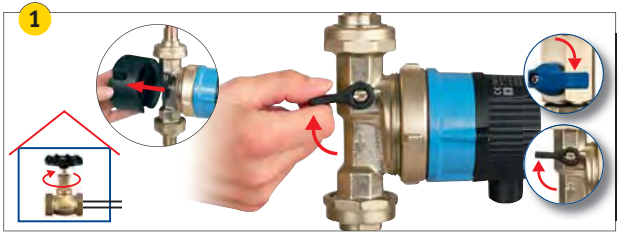
► With R 1/2" pumps (**2**), build in an additional non-return valve **RV 153** and a ball shut-off valve **KV 150**.

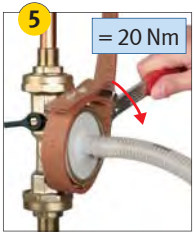


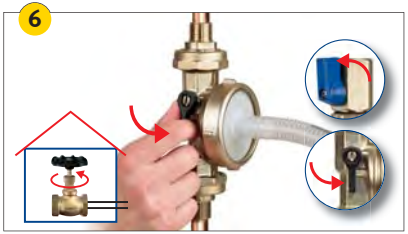
Installation

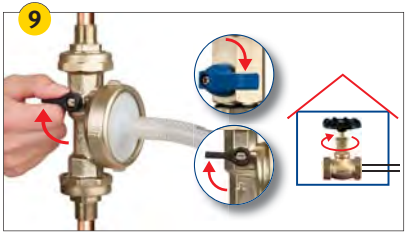
Careful! Damage to bearings caused by dry-running.

► Flush pipework thoroughly with water and bleed (see figs. 1-12).

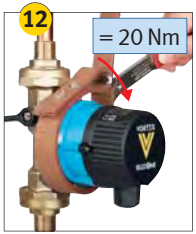








Installation



Careful! Damage to bearings caused by dry-running.

► Flood the pump before connecting electricity: Open all stop valves slowly (see fig. 13).

Electrical connection

- The drive of the pump is a DC motor. Thus a protective conductor is not required.
- For AC operation a transformer is integrated in the cap.

Danger! Danger of electrocution.

► Have all electrical work carried out by qualified electricians only.

► Turn off the power supply and safeguard it against being switched back on (see fig. 1).

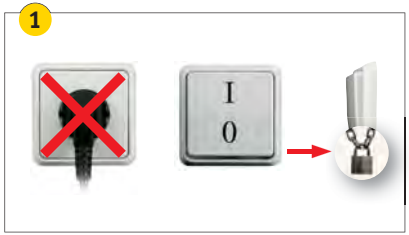
► Check to make sure the power is turned off.

Warning! Fire hazard due to electrical ignition.

► Make sure that the pump is only connected to the power supply specified on the name plate.

Note: The pump deletes all commands for automatic starts if the power supply is shut off.

► The pump requires an independent electrical power supply. Do not connect the pump to an additional controller or timer.

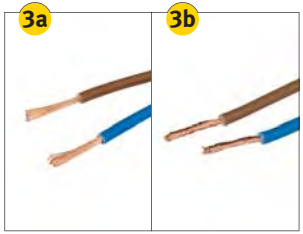


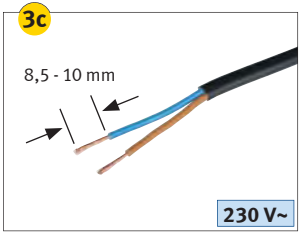
► A permanent power supply is possible, alternatively use a mains plug with IP 44 rating (provide isolator that separates all poles).

► Cable diameter 0.75 – 1.5 mm²

► Round cable with Ø 5 – 8 mm

► Connection with twisted wires, no wire end sleeves, no tinned ends

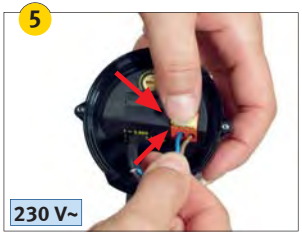




Electrical connection

4

5



6

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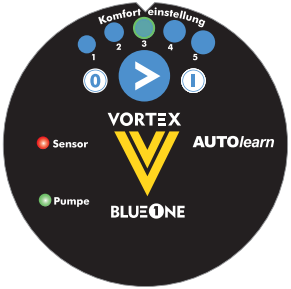
- The pump will run continuously as long as the sensor cable is not connected (see fig. 11).

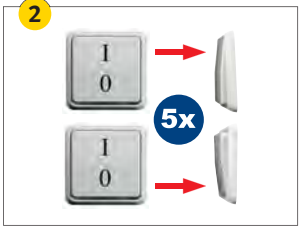
11

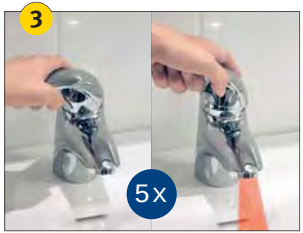


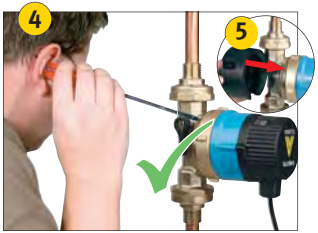
Venting

Warning! Hot surface on pump housing and motor. Danger of burns!
► Avoid direct contact with pump housing and motor.

► Ensure that the return line is air-free (see p. 7). Then act as follows to bleed the pump until it runs noise-free (alternately):
► Switch the pump on and off several times (see fig. 2).
► Open a hot water tap several times (see fig. 3).

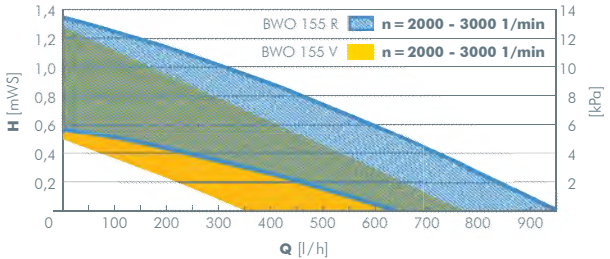






Speed adjustment

■ The speed is infinitely variable.



Warning! Hot surface on pump housing and motor. Danger of burns!
► Avoid direct contact with pump housing and motor.

Danger! Danger of electrocution.
► Before working on the pump, disconnect power supply and ensure that it cannot be re-connected unintentionally (see fig. 1, p. 12).
► Check to make sure the power is turned off.

Speed adjustment

Mounting cable box

Note! Malfunctions of the self-learning module are possible as a result of incorrect installation.

► Note order of assembly steps (installation sequence).

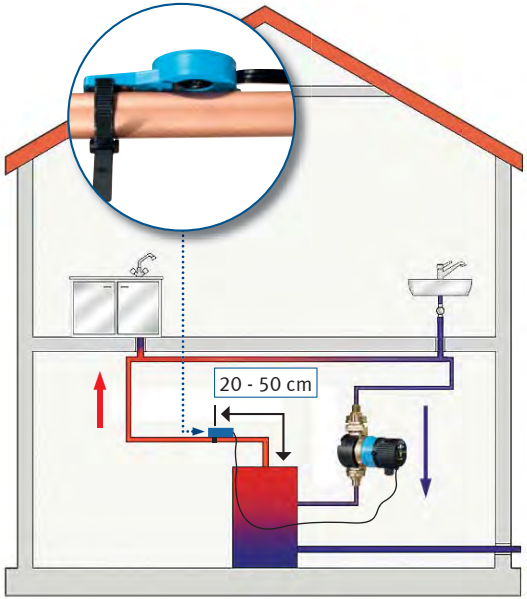
► Disconnect power supply and ensure that it cannot be reconnected unintentionally (see fig. 1).

1

Installation conditions

- The cable box must be mounted onto the supply line (hot water pipe), independently from the type of hot water generating system used.
- Optimal distance of the cable box to the boiler: 20 to 50 cm.
- If a mixer valve is present: The cable box can be installed before or after the mixer valve.

2



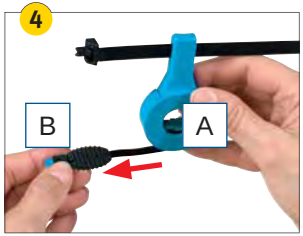
Mounting cable box

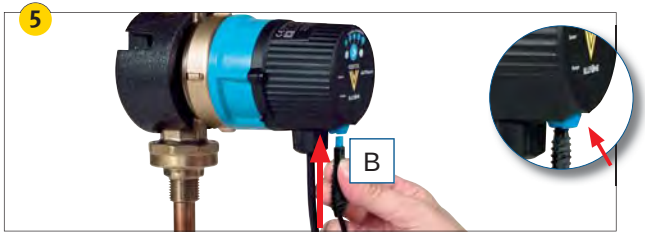
Installation sequence

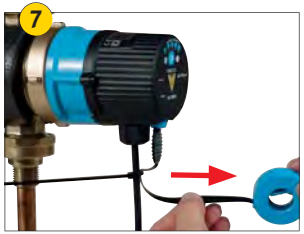
- Measure distance between pump and point of installation of cable box. Only pull as much sensor cable from the cable box as required. The maximum length of the sensor cable is 2.50 m. A 5m long sensor cable is available as an accessory.
- The sensor cable can only be wound up or unwound when plug A is still inside the cable box (see fig. 4).

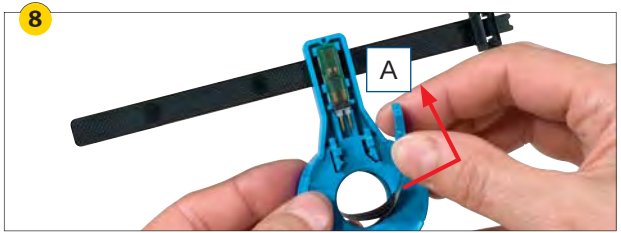
Warning! Danger of stumbling by loose sensor cable.

► Secure the sensor cable with the cable ties after laying (see figs. 6 and 14).

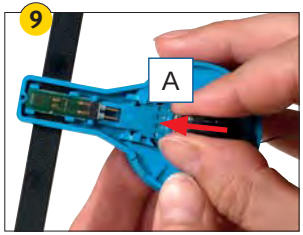


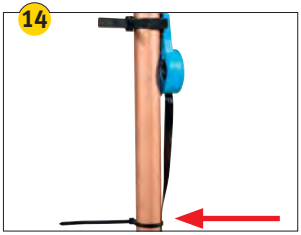


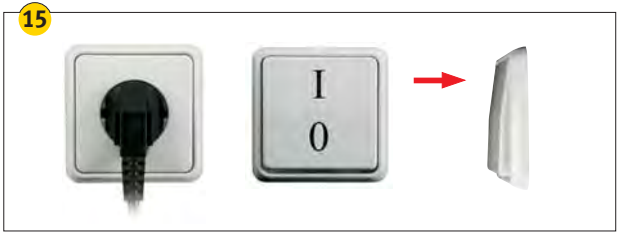




Mounting cable box







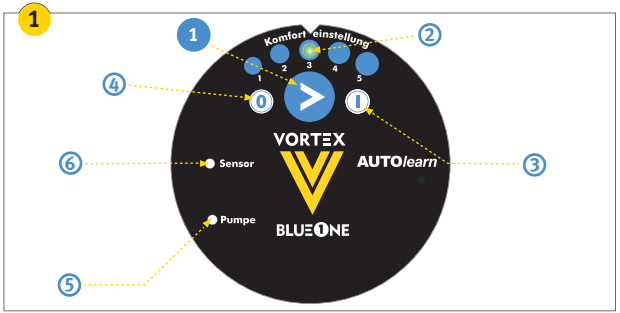
- ► Fix cable box to supply line using the cable tie.
- ► Ensure there is sufficient thermal contact between the sensor and the supply line.

- ■ Restart: As soon as the power supply has been restored, the pump and the self-learning module will be ready for operation, LED indicator 3 will be illuminated (basic setting), and the learning process will begin.

Self-learning module

- After establishing a connection to the electric power grid, the comfort setting 3 will be set (LED ② is illuminated). This comfort setting is optimal for the majority of the applications.
- ► We recommend to wait three weeks before altering the comfort settings.
- ► If no hot water is available immediately after opening a tap, close tap again and wait until circulation has started.
- The comfort setting is retained (non-volatile) in case of power failure.

Button ● and LED indicators ○:



Legend for fig. 1:

1 Select the operating mode (clockwise):
- ② Comfort setting
- ③ Continuous pump run
- ④ Pump stop

⑤ Pump is running (LED is illuminated green) or it is switched off (LED is not illuminated)

⑥ Sensor fault (LED is illuminated red, see p. 23)

Changing the operating mode:

► Press 1 until the desired operating mode is illuminated. It will be active immediately.

Comfort settings:

- Step 1: Maximum energy savings, minimum pump run times
- Step 2: Normal comfort, short pump run times
- Step 3: Basic setting – good comfort, average pump run times
- Step 4: Very high comfort, normal pump run times
- Step 5: Maximum comfort, increased pump run times

Restoring the factory default settings (reset):

- Press 1 for 5 seconds. All acquired switch-on commands will be deleted, comfort setting 3 will be set again.

Description of functions

- How does the pump learn?
  A hot water tap is opened. The supply line heats up. This is detected by the pump through the external temperature sensor and the point in time of the hot water tap is learned. For periodic (typical) taps the pump will proactively execute a pump run (approx. 5 to 15 minutes prior to that point in time).
- When does the pump start to run?
  For reasons of comfort and independent of DHW drawings, the pump starts frequently during the first 2 weeks (early part of the learning phase).
  Afterwards, the pump starts in the following cases:
  - proactively (at the typical "learned" points in time),
  - when hot water is tapped (at not yet learned points in time),
  - for a flushing or disinfection cycle (see below).
  The pump calculates the need for a pump run individually every single day (Mon to Sun) based on the previous hot-water taps of the last 2 weeks.
- How long does the pump run?
  The pump will run until the circulation loop is supplied with warm water (detection through a thermostat in the pump). The run time depends on the size of the circulation system.
- How long does the pump run per day?
  The daily runtime depends on the size of the circulation system, the comfort setting and the tapping behavior of the consumer. Typically, the pump will run between 1 and 5 hours daily.
- How does the disinfection cycle recognition work?
  The highest flow temperature measured in a given week is interpreted as the disinfection temperature. At this point in time, the pump will run for 30 minutes (once per week). If at any other time of the week a higher supply temperature is detected, the pump will shift the disinfection cycle to that point in time.
- How is absence detected (vacation detection)?
  If no hot water is tapped within 24 hours, the pump will determine an absence. Proactive pump runs will no longer occur. A detected disinfection cycle will still be performed (once per week). Otherwise, the pump will perform a daily flushing cycle (duration: 15 minutes).
- How will the return from the absence be recognized?
  With 2 hot water tappings within an hour the previously learned cycle will come into effect again.
- How do you delete the learned tappings (reset)?
  The self-learning module erases all learned switch-on commands if the power is interrupted or the button 1 is pressed for 5 seconds.

Servicing

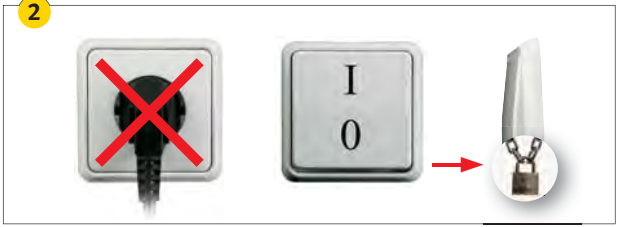
Note: Damage of sensor cable.

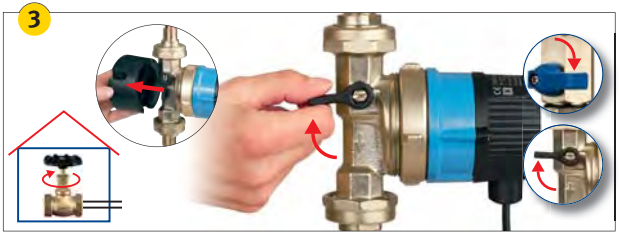
► When removing the motor from the pump housing, pay attention to the sensor cable (fixed with cable ties).

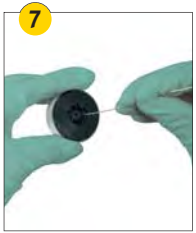
Danger! Danger of electrocution.

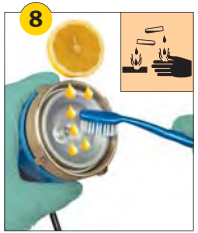
► Before working on the pump, disconnect power supply and ensure that it cannot be reconnected unintentionally (see fig. 2).

► Check to make sure the power is turned off.



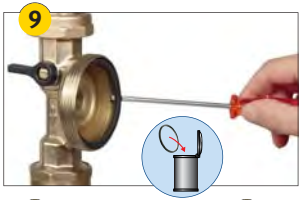


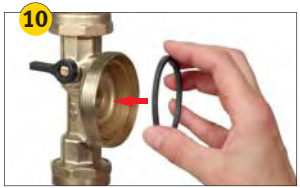


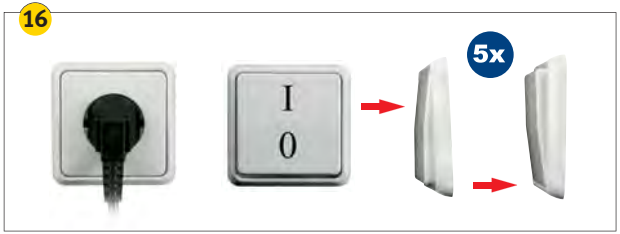


Servicing

- ► Every time the motor is opened, replace the sealing ring (see fig. 9).
- ► Insert the new sealing ring into the groove in the pump housing and press slightly into place (see fig. 10).







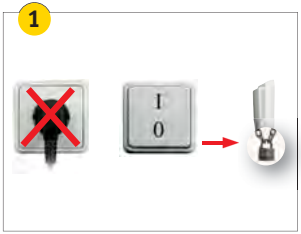
- ► Technical support is available from your heating and sanitary specialist or from Deutsche Vortex.

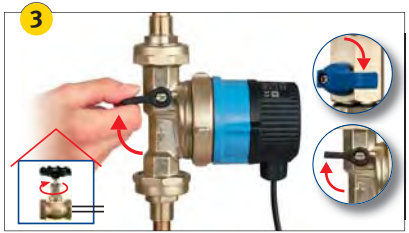
Replacement

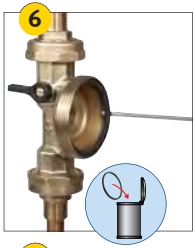
Motor

Danger! Danger of electrocution.

- ► Before working on the pump, disconnect power supply and ensure that it cannot be reconnected unintentionally (see fig. 1).
- ► Check to make sure the power is turned off.







Replacement

► Concluding the exchange: See chapters starting at Electrical Connection, p. 9 and further.

Cap/control module

Danger! Danger of electrocution.

► Have all electrical work carried out by qualified electricians only.

► Disconnect power supply and ensure that it cannot be reconnected unintentionally (see fig. 1).

► Check to make sure the power is turned off.

1

2

3

► Concluding the exchange: See chapters starting at Electrical Connection, p. 9 and further.

Faults and remedies

► Observe the chapter “Safety” (see p. 3).

Fault	Cause	Remedy	Chapter/page
Pump is not running: LED "Pumpe" (pump) is not illuminated.	■ Power supply is interrupted.	► Make sure that the power supply is established correctly.	Electrical connection, p. 9.
	■ Cooling down, in case of a detected absence or if there is no current demand.	► Wait for the next pump start or tap hot water.	
Pump is not running: LED "Pumpe" (pump) is illuminated.	■ Motor is defective (electrical/electronics).	► Replace motor.	Replacement, p. 20.
	■ Rotor is blocked because the rotor bearing is defective.		
	■ Rotor is blocked by debris.	► Clean wetted parts.	Servicing, p. 18.
LED "Sensor" is illuminated red.	■ External sensor is defective.	► Replace the cable box.	Mounting cable box, p. 13 and further
	■ Sensor cable connection is interrupted.	► Check electrical connections (contact of blue plugs) and replace module, if required.	Mounting cable box, p. 13 and further
Pump stops the rotor continuously.	■ Air in the pump housing, dry run protection is active.	► Bleed the circulation line.	Installation, p. 6 and Venting, p. 11.

Faults and remedies

► Observe the chapter “Safety” (see p. 3).

Fault	Cause	Remedy	Chapter/page
The pump "is not learning” / insufficient DHW provision.	■ The circulation is blocked.	► Restore the flow.	
	■ The cable box is not mounted to the supply line.	► Mount the cable box to the supply line (avoid mounting on braces, valves etc.).	Mounting cable box, p. 13 and further
	■ The cable box is mounted on a non-heat conducting piece of pipework.	► Use heat conducting pipework material (metal, plastic, composites).	Mounting cable box, p. 13 and further
	■ Non-return valve is missing or constantly open (gravity circulation!).	► Install or replace V-pump housing or the non-return valve RV 153.	
	■ Speed is set too low.	► Increase speed.	Speed adjustment, p. 11 and further.
	■ No hydraulic balancing where there are branches in the pipework.	► Perform hydraulic balancing or install a different control module (timer or control thermostat)	
	■ Pipework too extensive; pump rate too low.	► Install a larger DHW circulation pump.	
Pump makes noise.	■ Air in the pump housing.	► Bleed the circulation line.	Installation, p. 6 and Venting, p. 11.
	■ Rotor bearing defective.	► Replace the rotor. If the bearing pin is damaged exchange the motor.	Replacement, p. 20.
	■ Non-return valve is loose.	► Exchange the V-type pump housing or non-return valve installed behind the pump (e.g. RV 153).	Installation, p. 6.

BWO 155 SL

ORIGINAL OPERATING INSTRUCTIONS

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